UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,848	12/15/2005	Gijsbertus Franciscus Roovers	SPIN1	2105

6980 7590 11/12/2008

TROUTMAN SANDERS LLP
600 PEACHTREE STREET , NE
ATLANTA, GA 30308

EXAMINER	
ALTUN, NURI B	
ART UNIT	PAPER NUMBER
3657	
MAIL DATE	DELIVERY MODE
11/12/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/560,848	ROOVERS ET AL.	
	Examiner	Art Unit	
	NURI ALTUN	3657	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 December 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/12/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This communication is a first Office Action Non-Final rejection on the merits. Claims 1-31 are currently pending and have been considered below.

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Netherlands on 06/17/03 and 06/27/03. It is noted, however, that applicant has not filed a certified copy of the 1023681 and 1023765 applications as required by 35 U.S.C. 119(b). See MPEP Section 1893.03(c) III for further details.

Specification

The disclosure is objected to because of the following informalities: **Page 11, line 31 of the Specification recites, "a primary arm part 210 which contains the first mounting hole 202," which appears to be wrong because secondary arm part 220 contains the first mounting hole 202.**

Appropriate correction is required.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: **Figure 7, reference number 15.** Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version

of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim **5, 17-20, 28 and 31** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims **5, 17, 19, 20, 28 and 31**, the phrases "preferably," for instance" and "particularly" render the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then

narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim **17** recites the broad recitation **the contact faces of the force sensor are manufactured of a sound production material**, and the claim also recites **the whole sensor is *preferably* manufactured of a sound production counteracting material, said material comprising *for instance* a synthetic material** which is the narrower statement of the range/limitation.

Claim **18** recites the limitation "**the measuring sensor**" in **line 2 of the claim**. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim **1-4, 7, 10-13, 16, 21-23 and 26-30** are rejected under 35 U.S.C. 102(b) as being anticipated by **Venema (3,992,932)**.

As per claim 1, Venema teaches a transmission system comprising:

a drive wheel (12), a driven wheel (11), and a coupling chain (10) having a first chain half and a second chain half (see Fig. 2);

a tension difference measuring device (26) for providing a measurement signal which is representative for the torque transmitted by the coupling chain (col.2, lines 24-27);

said measuring device comprising a transverse force sensor (22; 23) arranged within the span of the coupling chain, provided with measuring means, for providing a measurement signal (col.2, lines 24-38) which is a measure for the component, directed substantially perpendicular to the plane defined by the rotation axes of the drive wheel (12) and the driven wheel (11) (see Fig. 3), of the resultant of the transverse forces (F.sub.1, F.sub.2) exerted to the sensor by the chain parts (col.2 line 53 – col.3 line4).

As per claim 2, Venema teaches the transverse force (22; 23) sensor is arranged between the drive wheel (12) and the driven wheel (11), and has a first contact face (surface of 22) touching the first chain half and a second contact face (surface of 23) touching the second chain half.

As per claim 3, Venema teaches the transverse force sensor (22; 23) has a circular outline.

As per claim 4, Venema teaches the transverse force sensor (22; 23) is rotatably mounted.

As per claim 7, Venema teaches the center point of the transverse force sensor (22; 23) is substantially located in the plane defined by the rotation axes of the drive wheel (12) and the driven wheel (11) (see Fig. 1), and wherein a rotation axis (line along

24 and 25) of the transverse force sensor is directed substantially parallel to the rotation axes (line along 13 and 15) of the drive wheel (12) and the driven wheel (11).

As per claim 10, Venema teaches said measuring means are adapted for measuring a displacement of the transverse force sensor (col.3, lines 5-13).

As per claim 11, Venema teaches said measuring means comprise a supporting arm (17) for the transverse force sensor, as well as a sensor (strain gauge) for measuring a deformation of the supporting arm (17) (col.3, lines 9-13; since the force acts on the arm, it is inherent that deformation of arm will occur).

As per claim 12, Venema teaches said supporting arm (17) is directed substantially perpendicular with respect to the plane defined by the rotation axes of the drive wheel (12) and the driven wheel (11), and wherein said sensor is adapted for measuring a change in length of the supporting arm (col.3, lines 5-13).

As per claim 13, Venema teaches said supporting arm (17) is directed substantially perpendicular with respect to the plane defined by the coupling chain (10) (see Fig. 1), and wherein said sensor is adapted for measuring a bending of the supporting arm (col.3, lines 5-13).

As per claim 16, Venema teaches the measuring sensor comprises one or more strain gauges (col.2, lines 28-29).

As per claim 21, Venema teaches a method for measuring a drive force being transmitted by a transmission system, comprising:

a drive wheel (12), a driven wheel (11), and a coupling chain (10) having a first chain half and a second chain half (see Fig. 2);

said method comprising the steps of:

providing a transverse force sensor (22; 23) having a first contact face and a second contact face (see Fig. 1);

arranging the transverse force sensor between the drive wheel and the driven wheel within the span of the chain (10), in such a way that the first contact face is in force transmitting contact with the first chain half and that the second contact face is in force transmitting contact with the second chain half; measuring the component (col.2, lines 24-38), directed substantially perpendicular to the plane defined by the rotation axes of the drive wheel and the driven wheel, of the resultant of the transverse forces exerted to the transverse force sensor (22; 23) by the first chain half and the second chain half (col.2 line 53 – col.3 line4 and see Fig. 2).

As per claim 22, Venema teaches force component is measured by measuring a displacement of the transverse force sensor caused by said force component (col.3, lines 5-13).

As per claim 23, Venema teaches the transverse force sensor (22; 23) is fixed with a supporting arm (17) with respect to the transmission system, and wherein said displacement is measured by measuring a deformation of the supporting arm (17) of the transverse force sensor caused by said force component (col.3, lines 9-13; since the force acts on the arm, it is inherent that deformation of arm will occur).

As per claim 26, Venema teaches tension difference measuring system for measuring the drive force being transmitted by a transmission system, comprising

a drive wheel (12), a driven wheel (11), and a coupling chain (10) having a first chain half and a second chain half (see Fig. 1);

said measuring system comprising:

a transverse force sensor (22; 23) having a first contact face and a second contact face (see Fig. 1), suitable for placing between the drive wheel and the driven wheel within the span of the coupling chain (10), in such a way that the first contact face is in force transmitting contact with the first chain half and that the second contact face is in force transmitting contact with the second chain half (col.2 line 53 – col.3 line4 and see Fig. 2);

said measuring system being suitable for performing the method according to claim 21.

As per claim 27, Venema teaches a measuring system, furthermore comprising a supporting arm (17) carrying the transverse force sensor (22; 23), which arm is suitable for fixing the transverse force sensor with respect to the transmission system (see Fig. 1).

As per claim 28, Venema teaches the supporting arm (17) is provided with a deformation sensor, for instance one or more strain gauges (col.2, lines 28-29).

As per claim 29, Venema teaches the transverse force sensor (22; 23) has a circular outline and is rotatably attached to the supporting arm (17) (See Fig. 1).

As per claim 30, Venema teaches the supporting arm (17) has an elongated hole (the hole of 24) for mounting the transverse force sensor (22), said elongated hole

having a longitudinal direction which substantially coincides with the longitudinal direction of the supporting arm (17) (see Fig. 1).

Claims **21 and 26** are rejected under 35 U.S.C. 102(b) as being anticipated by **Searle (GB 2,312,193)**.

As per claim 21, Searle teaches a method for measuring a drive force being transmitted by a transmission system, comprising:

a drive wheel, a driven wheel (B1, B2), and a coupling chain (A) having a first chain half and a second chain half (see Fig. 1);

said method comprising the steps of:

providing a transverse force sensor (C) having a first contact face and a second contact face (see Fig. 1);

arranging the transverse force sensor (C) between the drive wheel and the driven wheel within the span of the chain (A), in such a way that the first contact face is in force transmitting contact with the first chain half and that the second contact face is in force transmitting contact with the second chain half (see the upper and lower sections of chain in Fig. 1);

measuring the component, directed substantially perpendicular to the plane defined by the rotation axes of the drive wheel and the driven wheel, of the resultant of the transverse forces (see the arrow in Fig. 1) exerted to the transverse force sensor (C) by the first chain half and the second chain half.

As per claim 26, Searle teaches tension difference measuring system for measuring the drive force being transmitted by a transmission system, comprising

a drive wheel, a driven wheel (B1, B2), and a coupling chain (A) having a first chain half and a second chain half (see Fig. 1);

said measuring system comprising:

a transverse force sensor (C) having a first contact face and a second contact face (see Fig. 1), suitable for placing between the drive wheel and the driven wheel within the span of the coupling chain (A), in such a way that the first contact face is in force transmitting contact with the first chain half and that the second contact face is in force transmitting contact with the second chain half (see the upper and lower sections of chain in Fig. 1);

said measuring system being suitable for performing the method according to claim 21.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim **5** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Venema (3,992,932),** as applied to claim 4 above, in view of **Suolahti (6,305,145).**

Venema teaches all the structural limitations of the claimed invention as mentioned in claim 4 above, but doesn't explicitly disclose a force sensor is mounted on an axle of the rotatably mounted transverse force sensor, said force sensor preferably comprising a sensor sensitive to bending of the said axle.

Suolahti teaches a wrapping apparatus having a force sensor (8) is mounted on an axle (14) of the rotatably mounted transverse force sensor (see Fig. 2), said force sensor preferably comprising a sensor sensitive to bending of the said axle (it is inherent that a sensor placed on the axle is sensitive to bending of the axle).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmission system of Venema to include the force sensor mounting taught by Suolahti in order to maximize sensitivity.

Claim **6** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Venema (3,992,932),** as applied to claim 4 above, in view of **Augrende et al. (4,712,425).**

Venema teaches all the structural limitations of the claimed invention as mentioned in claim 4 above, but doesn't explicitly disclose a force sensor is mounted in a bearing of the rotatably mounted transverse force sensor, said force sensor preferably comprising a sensor sensitive to the resulting force exerted on the transverse force sensor.

Augrende et al. teach a wheel balancing machine particularly for automobile wheels having a force sensor (5; 6) is mounted in a bearing (3; 4) of the rotatably mounted transverse force sensor, said force sensor preferably comprising a sensor (3; 4) sensitive to the resulting force exerted on the transverse force sensor.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmission system of Venema to include the force sensor mounting taught by Augrende et al. in order to maximize sensitivity.

Claims **8 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Venema (3,992,932),** in view of **Todd et al. (20030087713)**.

As per claim 8, Venema teaches all the structural limitations of the claimed invention as mentioned in claim 2 above, but doesn't explicitly disclose the two contact faces are convex with a varying curvature radius.

Todd et al. teach a tensioner (10) with vibrational damping with the two contact faces (two surfaces of 30) being convex with a varying curvature radius (see Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmission system of Venema to include the contact faces taught by Todd et al. in order to maximize compactness.

As per claim 9, Venema teaches all the structural limitations of the claimed invention as mentioned in claim 2 above, but doesn't explicitly disclose the two contact faces are convex with a curvature radius which is larger than half the distance between both contact faces.

Todd et al. teach the two contact faces (two surfaces of 30) are convex with a curvature radius which is larger than half the distance between both contact faces (see Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmission system of Venema to include the contact faces taught by Todd et al. in order to increase the contact surface with the chain.

Claim **14** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Venema (3,992,932),** as applied to claim 11 above, in view of **Nicolau (3,832,899).**

Venema teaches all the structural limitations of the claimed invention as mentioned in claim 11 above, but doesn't explicitly disclose said supporting arm (6) is directed substantially parallel to the plane defined by the rotation axes of the drive wheel (2) and the driven wheel (3) and is directed substantially parallel to the plane defined by the coupling chain (1) (see Fig. 2), and wherein said sensor (7) is adapted for measuring a bending of the supporting arm.

Nicolau teaches a dynamometrical deflection measuring method and apparatus having the supporting arm (6) is directed substantially parallel to the plane defined by the rotation axes of the drive wheel (2) and the driven wheel (3) and is directed substantially parallel to the plane defined by the coupling chain (1) (see Fig. 2), and wherein a sensor (7) is adapted for measuring a bending of the supporting arm.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mechanism of Venema to include the arrangement taught by Nicolau in order to maximize compactness.

Claim **15** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Venema (3,992,932),** in view of **Nicolau (3,832,899),** as applied to claim 14, further in view of **Suolahti (6,305,145).**

Venema and Nicolau combination teaches all the structural limitations of the claimed invention as mentioned in claim 14 above, but doesn't explicitly disclose said supporting arm is attached to a wheel axle of the drive wheel or of the driven wheel.

Suolahti teaches a supporting arm (13) is attached to a wheel axle (14) of the wheel (25) (col.4, lines 5-6).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination of Venema and Nicolau to include the supporting arm arrangement taught by Suolahti in order to maximize compactness.

Claim **17** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Venema (3,992,932)**.

Venema teaches all the structural limitations of the claimed invention, as mentioned in claim 2 above, but doesn't explicitly disclose at least the contact faces of the force sensor are manufactured of a sound production counteracting material, wherein the whole force sensor is preferably manufactured of a sound production counteracting material, said material comprising for instance a synthetic material. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the contact faces of the force sensor to be manufactured of a sound production counteracting material comprising for instance a synthetic material to prevent damage. Also note *MPEP Section 2144.07* states that the selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination.

Claim **18** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Venema (3,992,932),** in view of **Hordnes et al. (5,445,036)**.

Venema teaches all the structural limitations of the claimed invention as mentioned in claim 1 above, but doesn't explicitly disclose the transverse force sensor is

one of the wheels, and wherein the measuring sensor is adapted for measuring the force exerted to the wheel concerned in a direction substantially perpendicular to the plane defined by the rotation axes of the drive wheel and the driven wheel.

Hordnes et al. teach a torque sensor with the concept of having the transverse force sensor is one of the wheels (see Fig. 1), and wherein the measuring sensor (36) is adapted for measuring the force exerted to the wheel concerned in a direction substantially perpendicular to the plane defined by the rotation axes of the drive wheel and the driven wheel (col.3, lines 39-47).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mechanism of Venema to include the sensor taught by Hordnes et al. in order to maximize compactness.

Claims **19 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Venema (3,992,932),** in view of **Searle (GB 2,312,193)**.

Venema teaches all the structural limitations of the claimed invention as mentioned in claim 1 above, but doesn't explicitly disclose a vehicle comprising aforementioned transmission system driven by human force, particularly a bicycle (claim 19) and a training device comprising aforementioned transmission system, which can be a bicycle training device, for instance a home trainer or a spinning bike (claim 20).

Searle teaches a bicycle (Claim 19) and a bicycle training device (Claim 20) (see page 1, paragraphs 1-4; pedal cycles are construed to be riding a bicycle or training device).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mechanism of Venema to include vehicle taught by Searle in order to put the invention to a daily use.

Claims **22, 23 and 27-30** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Searle (GB 2,312,193),** in view of **Venema (3,992,932)**.

As per claim 22, Searle teaches all the structural limitations of the claimed invention as mentioned in claim 21 above, but doesn't explicitly disclose said force component is measured by measuring a displacement of the transverse force sensor caused by said force component.

Venema teaches force component is measured by measuring a displacement of the transverse force sensor caused by said force component (col.3, lines 5-13).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mechanism of Searle to include the measurement technique taught by Venema in order to maximize sensitivity.

As per claim 23, Searle teaches all the structural limitations of the claimed invention as mentioned in claim 22 above, but doesn't explicitly disclose the transverse force sensor is fixed with a supporting arm with respect to the transmission system, and wherein said displacement is measured by measuring a deformation of the supporting arm of the transverse force sensor caused by said force component.

Venema teaches the transverse force sensor (22; 23) is fixed with a supporting arm (17) with respect to the transmission system, and wherein said displacement is measured by measuring a deformation of the supporting arm (17) of the transverse

force sensor caused by said force component (col.3, lines 9-13; since the force acts on the arm, it is inherent that deformation of arm will occur).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mechanism of Searle to include the supporting arm taught by Venema in order to provide better measurement.

As per claim 27, Searle teaches all the structural limitations of the claimed invention, as mentioned in claim 26, but doesn't explicitly disclose a supporting arm carrying the transverse force sensor, which arm is suitable for fixing the transverse force sensor with respect to the transmission system.

Venema teaches a measuring system, furthermore comprising a supporting arm (17) carrying the transverse force sensor (22; 23), which arm is suitable for fixing the transverse force sensor with respect to the transmission system (see Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mechanism of Searle to include the supporting arm taught by Venema in order to maximize compactness.

As per claim 28, Searle teaches all the structural limitations of the claimed invention, as mentioned in claim 27, but doesn't explicitly disclose the supporting arm is provided with a deformation sensor, for instance one or more strain gauges.

Venema teaches the supporting arm (17) is provided with a deformation sensor, for instance one or more strain gauges (col.2, lines 28-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mechanism of Searle to include the strain gauge taught by Venema in order to increase sensitivity.

As per claim 29, Searle teaches all the structural limitations of the claimed invention, as mentioned in claim 27, but doesn't explicitly disclose the transverse force sensor has a circular outline and is rotatably attached to the supporting arm.

Venema teaches the transverse force sensor (22; 23) has a circular outline and is rotatably attached to the supporting arm (17) (See Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mechanism of Searle to include the outline taught by Venema in order to maximize compactness.

As per claim 30, Searle teaches all the structural limitations of the claimed invention, as mentioned in claim 27, but doesn't explicitly disclose the supporting arm has an elongated hole for mounting the transverse force sensor, said elongated hole having a longitudinal direction which substantially coincides with the longitudinal direction of the supporting arm.

Venema teaches the supporting arm (17) has an elongated hole (the hole of 24) for mounting the transverse force sensor (22), said elongated hole having a longitudinal direction which substantially coincides with the longitudinal direction of the supporting arm (17) (see Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mechanism of Searle to include the elongated hole taught by Venema in order to maximize compactness.

Claim **24** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Venema (3,992,932)**, as applied to claim 22 above, in view of **Suolahti (6,305,145).**

Venema teaches all the structural limitations of the claimed invention as mentioned in claim 22 above, but doesn't explicitly disclose the transverse force sensor is mounted on an axle, on which axle a force sensor is mounted, and wherein said displacement is measured by measuring a deformation of said axle of the transverse force sensor (10) caused by said force component .

Suolahti teaches the transverse force sensor is mounted on an axle (14), on which axle a force sensor (8) is mounted (see Fig. 2), and

wherein said displacement is measured by measuring a deformation of said axle of the transverse force sensor caused by said force component (it is inherent that a sensor placed on the axle on which a force component acts will measure the deformation of the axle).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mechanism of Venema to include the force sensor mounting taught by Suolahti in order to maximize sensitivity.

Claim **24** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Searle (GB 2,312,193),** in view of **Venema (3,992,932)**, as applied to claim 22 above, further in view of **Suolahti (6,305,145).**

Searle and Venema combination teaches all the structural limitations of the claimed invention as mentioned in claim 22 above, but doesn't explicitly disclose the transverse force sensor is mounted on an axle, on which axle a force sensor is mounted, and wherein said displacement is measured by measuring a deformation of said axle of the transverse force sensor (10) caused by said force component .

Suolahti teaches the transverse force sensor is mounted on an axle (14), on which axle a force sensor (8) is mounted (see Fig. 2), and

wherein said displacement is measured by measuring a deformation of said axle of the transverse force sensor caused by said force component (it is inherent that a sensor placed on the axle on which a force component acts will measure the deformation of the axle).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination of Searle and Venema to include the force sensor mounting taught by Suolahti in order to maximize sensitivity.

Claim **25** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Venema (3,992,932)**, as applied to claim 22 above, in view of **Augrende et al. (4,712,425).**

Venema teaches all the structural limitations of the claimed invention as mentioned in claim 22 above, but doesn't explicitly disclose wherein the transverse force sensor is rotatably mounted in a bearing, wherein a force sensor is mounted in the bearing of the transverse force sensor, and wherein said displacement is measured by measuring a force on the bearing of the transverse force sensor caused by said force component.

Augrende et al. teach the transverse force sensor is rotatably mounted in a bearing (3; 4), wherein a force sensor (5; 6) is mounted in the bearing (3; 4) of the transverse force sensor, and

wherein said displacement is measured by measuring a force on the bearing of the transverse force sensor (10) caused by said force component (see Fig. 1; it is construed that force component acts on the bearing which os measured by the sensor).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mechanism of Venema to include the force sensor mounting taught by Augrende et al. in order to maximize sensitivity.

Claim **25** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Searle (GB 2,312,193),** in view of **Venema (3,992,932)**, as applied to claim 22 above, further in view of **Augrende et al. (4,712,425).**

Searle and Venema combination teaches all the structural limitations of the claimed invention as mentioned in claim 22 above, but doesn't explicitly disclose wherein the transverse force sensor is rotatably mounted in a bearing, wherein a force sensor is mounted in the bearing of the transverse force sensor, and wherein said displacement is measured by measuring a force on the bearing of the transverse force sensor caused by said force component.

Augrende et al. teach the transverse force sensor is rotatably mounted in a bearing (3; 4), wherein a force sensor (5; 6) is mounted in the bearing (3; 4) of the transverse force sensor, and

wherein said displacement is measured by measuring a force on the bearing of the transverse force sensor (10) caused by said force component (see Fig. 1; it is construed that force component acts on the bearing which os measured by the sensor).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination of Searle and Venema to include the force sensor mounting taught by Augrende et al. in order to maximize sensitivity.

Claim **31** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Venema (3,992,932)**, as applied to claim 27 above, in view of **Eddens (4,899,599).**

Venema teaches all the structural limitations of the claimed invention, as mentioned in claim 27, but doesn't explicitly disclose the supporting arm has a cut-away which divides the arm in a primary arm part and a secondary arm part which supports the transverse force sensor; wherein the secondary arm part is connected to the primary arm part by at least two bridge parts; wherein a deformation sensor is mounted on a side face of at least one bridge part, the sensor preferably comprising two strain gauges.

Eddens teaches a strain force sensor means having the supporting arm having a cut-away (34) which divides the arm in a primary arm part (28) and a secondary arm part (26) which supports the transverse force sensor (20);

wherein the secondary arm part (26) is connected to the primary arm part (28) by at least two bridge parts (30, 32);

wherein a deformation sensor (22) is mounted on a side face of at least one bridge part (30) (see Fig. 1), the sensor preferably comprising two strain gauges (see abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the mechanism of Venema to include the cut-away taught by Eddens in order to maximize sensitivity.

Claim **31** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Searle (GB 2,312,193),** in view of **Venema (3,992,932)**, as applied to claim 27 above, further in view of **Eddens (4,899,599).**

Searle and Venema combination teaches all the structural limitations of the claimed invention, as mentioned in claim 27, but doesn't explicitly disclose the supporting arm has a cut-away which divides the arm in a primary arm part and a secondary arm part which supports the transverse force sensor; wherein the secondary arm part is connected to the primary arm part by at least two bridge parts; wherein a deformation sensor is mounted on a side face of at least one bridge part, the sensor preferably comprising two strain gauges.

Eddens teaches a strain force sensor means having the supporting arm having a cut-away (34) which divides the arm in a primary arm part (28) and a secondary arm part (26) which supports the transverse force sensor (20);

wherein the secondary arm part (26) is connected to the primary arm part (28) by at least two bridge parts (30, 32);

wherein a deformation sensor (22) is mounted on a side face of at least one bridge part (30) (see Fig. 1), the sensor preferably comprising two strain gauges (see abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination of Searle and Venema to include the cut-away taught by Eddens in order to maximize sensitivity.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The reference Brandt, Jr. et al (5,678,678) teach an apparatus for measuring the profile of documents with similar features.

The reference Palfreyman (3,653,612) teaches a control wheel force sensor device having similar sensing means.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NURI ALTUN whose telephone number is (571)270-5807. The examiner can normally be reached on Mon-Fri 7:30 - 5:00 with first Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Siconolfi can be reached on (571) 272 7124. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bradley T King/
Primary Examiner, Art Unit 3657

NBA